CLAIMS

1. A method of using a computer processor to monitor items being received and disbursed within a predetermined environment, said method comprising:

(a) providing a computer monitoring system having a memory circuit for storage of data, a communications port, and a processing circuit;

(b) providing a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within said predetermined environment;

(c) determining a probability pattern of a velocity of said at least one item as it passes one of said plurality of sensing circuits, and storing said probability pattern in said memory circuit;

(d) receiving, by way of said communications port, identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits, and receiving time-related information corresponding to when said at least one item was detected by the one of said plurality of sensing circuits; and

(e) comparing an observed velocity of said at least one item passing one of said plurality of sensing circuits to said probability pattern, and determining whether or not said observed velocity is anomalous, and if so generating a velocity event announcement that said observed velocity is one of: (i) occurring too slowly, or (ii) occurring too quickly.

2. The method as recited in claim 1, wherein the step of determining a probability pattern of a velocity of said at least one item occurs during a Learning Mode of operation of said computer monitoring system.

3. The method as recited in claim 1, wherein the step of storing said probability pattern in said memory circuit comprises: creating or modifying an entry in a database that is stored in said memory circuit such that said entry can later be

accessed in substantially real time upon the occurrence of the step of comparing an observed velocity to said probability pattern.

4. The method as recited in claim 1, wherein said identification characteristic information comprises: an SKU identifier of said at least one item, or a bar code from a label affixed to said at least one item.

5. The method as recited in claim 1, wherein the step of comparing an observed velocity to said probability pattern occurs substantially in real time with respect to the occurrence of said step of receiving identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits, during a Detection Mode of operation of said computer monitoring system.

6. The method as recited in claim 1, wherein the step of receiving identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits occurs when said at least one item is being sold at a point-of-sale register within said predetermined environment, during a Detection Mode of operation of said computer monitoring system.

7. The method as recited in claim 6, wherein the step of generating a velocity event announcement when said observed velocity is occurring too slowly is indicative of one of the following conditions: (i) said at least one item is substantially hidden while residing in its correct location on a display shelf; (ii) said at least one item is completely out-of-stock on said display shelf; (iii) said at least one item has been placed at an incorrect location within said predetermined environment, or (iv) access to said at least one item has been substantially prevented by an obstruction.

8. The method as recited in claim 6, further comprising: generating an out-of-stock declaration for one of said at least one item in advance of an actual store-

out-of-stock condition for that item when said observed velocity is occurring too quickly in addition to other predetermined circumstances.

9. The method as recited in claim 6, wherein said step of determining whether or not said observed velocity is anomalous comprises: comparing the observed velocity of said at least one item to a probability velocity model for said at least one item, while taking into consideration at least one of the following factors: varying price conditions, time of day, day of week, week of year, promotion activities, or competitive activities.

10. The method as recited in claim 6, wherein said step of determining whether or not said observed velocity is anomalous comprises: comparing the observed velocity of said at least one item to a probability velocity model for said at least one item, while taking into consideration a usage history of items being disbursed and received.

11. The method as recited in claim 9, wherein said Detection Mode of operation and said Learning Mode of operation occur simultaneously to refine said probability velocity model for said at least one item, and further to detect a new item event and to begin creating a probability velocity model for any such new item.

12. An item velocity monitoring system, comprising:

(a) a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment;

(b) a computer monitoring system, comprising:

(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a bulk memory storage device;

(ii) a communications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and

(iii) a processing circuit that is configured to control the flow of data between said memory circuit and said communications port;

(c) said processing circuit also being configured to:

(i) determine a probability pattern of a velocity of said at least one item as it passes one of said plurality of sensing circuits, and to store said probability pattern in said memory circuit;

(ii) receive identification characteristic information pertaining to said at least one item as it passes one of said plurality of sensing circuits, and to receive time-related information corresponding to when said at least one item was detected by the one of said plurality of sensing circuits; and

(iii) compare an observed velocity of said at least one item passing one of said plurality of sensing circuits to said probability pattern, and to determine whether or not said observed velocity is anomalous, and if so to generate a velocity event announcement that said observed velocity is one of: (i) occurring too slowly, or (ii) occurring too quickly.

13. The item velocity monitoring system as recited in claim 12, further comprising: a point-of-sale controller that is in communication with said plurality of sensing circuits and with said communications port.

14. The item velocity monitoring system as recited in claim 12, wherein said predetermined environment comprises a retail store.

15. The item velocity monitoring system as recited in claim 12, wherein said predetermined environment comprises a warehouse.

16. The item velocity monitoring system as recited in claim 12, wherein said predetermined environment comprises a manufacture's distribution center.

17. A method of using a computer processor to analyze velocity patterns of movement of items being received and disbursed within a predetermined environment, said method comprising:

(a) providing a computer monitoring system having a memory circuit for storage of data, and a processing circuit;

(b) receiving data pertaining to at least one transaction involving at least one item of inventory in said predetermined environment; and

(c) using a dynamically determined probability pattern of a velocity of said at least one item, after said at least one transaction to determine whether an observed velocity is one of: (i) occurring too slowly, or (ii) occurring too quickly.

18. The method as recited in claim 17, wherein said dynamically determined probability pattern is stored in said memory circuit and uses a statistical model to predict a probability of inter-arrival times of said at least one item.

19. The method as recited in claim 18, wherein said statistical model comprises a modified Poisson distribution.

20. The method as recited in claim 18, further comprising: detecting an Out-of-Stock Event using a probability of observing zero sales of said at least one item since a last observed sale of that item.

21. The method as recited in claim 20, wherein said Out-of-Stock Event comprises a time interval during which said at least one item appears to be physically out-of-stock, and upon the occurrence of said Out-of-Stock Event the computer monitoring system summarizes events, including fast events and slow events, determines their causes, and measures their impacts.

22. The method as recited in claim 20, wherein said computer monitoring system provides forecasting of inventory or replenishment levels that removes effects of stock-outs before generating forecasting reports.

23. The method as recited in claim 18, wherein said dynamically determined probability pattern is determined by training said computer monitoring system by use of one of: (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time.

24. The method as recited in claim 23, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table or Item Table.

25. The method as recited in claim 24, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table or Item Table are used to calculate a probability distribution for an inter-arrival interval between sales of said at least one item, and wherein said inter-arrival interval is stated either in units of: (i) time, or (ii) quantity of sales in monetary units.

26. The method as recited in claim 19, wherein store sales or category sales are used to measure time in said modified Poisson distribution for inter-arrival times.

27. The method as recited in claim 26, wherein a choice is made whether to use store or category sales for time via standard deviations and standard errors for variables Lambda_1 and Lambda_2 of said modified Poisson distribution.

28. The method as recited in claim 26, wherein a Poisson parameter lambda is a function of Base Lambda and Adjustment Alpha, which include information as saved data and lookup tables on: SKU, store, and various effects, including price point, promotion, season, holiday, time-of-day, day-of-week, and market conditions.

29. The method as recited in claim 28, wherein a median is used to estimate said Lambda model parameter, thereby reducing bias in an estimate of a true

Lambda parameter arising from a contaminating effect of historical out-of-stock events.

30. The method as recited in claim 17, wherein the velocity of said at least one item comprises two random variables, inter-arrival time and quantity, which are linked together as a renewal-reward process, in which the quantity of an item is a separate random log-normal variable with a mean beta and a beta variance, and wherein said inter-arrival time comprises a modified Poisson distribution.

31. The method as recited in claim 30, wherein said mean and variance parameters to the renewal-reward process are not constants, but vary during the inter-arrival time as effects change.

32. The method as recited in claim 18, further comprising: detecting a slow event using a probability of observing more than K sales of said at least one item in the time actually observed for K arrivals of that item.

33. The method as recited in claim 18, further comprising: detecting a fast event using a probability of observing less than J sales of said at least one item in the time actually observed for J arrivals of that item.

34. A method of using a computer processor to analyze velocity patterns of movement of items being received and disbursed within a predetermined environment, said method comprising:

(a) providing a computer monitoring system having a memory circuit for storage of data, and a processing circuit; and

(b) automatically training said computer monitoring system using either historical data or data gathered in substantially real time, thereby learning item velocities for a plurality of items.

35. The method as recited in claim 34, wherein said item velocities vary as a function of: total predetermined environment velocity, time of day, day of week, season, holidays, and market conditions of said predetermined environment.

36. The method as recited in claim 34, wherein said predetermined environment comprises one of: a retail store, a chain of retails stores, a warehouse, a chain of warehouses, a distribution point, or a chain of distribution points.

37. The method as recited in claim 34, further comprising: automatically re-training said computer monitoring system on a periodic basis using substantially real time data throughout a periodic interval.

38. The method as recited in claim 34, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

39. The method as recited in claim 38, wherein said iterative passes comprise: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table.

40. The method as recited in claim 39, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution for an inter-arrival interval between sales of said at least one item, and wherein said inter-arrival interval is stated either in units of: (i) time, or (ii) quantity of sales in monetary units.

41. A computerized method to determine the cause of out-of-stock events in a predetermined environment, the method comprising:

receiving data pertaining to transactions involving items of inventory in said predetermined environment;

detecting a plurality of out-of-stock events for at least one item of inventory, each out-of-stock event having associated attributes; and

determining automatically the cause of at least one out-of-stock event based upon the attributes associated therewith.

42. The method as recited in claim 41, wherein determining that an out-of-stock event exists further comprises analyzing said at least one item's predetermined probability pattern of velocity.

43. The method as recited in claim 41, wherein determining automatically the cause of the at least one out-of-stock event comprises:

analyzing the plurality of out-of-stock events according to an automated induction software algorithm to identify discovered attribute sets; and

matching attributes associated with the at least one out-of-stock event with a discovered attribute set.

44. The method as recited in claim 43 wherein analyzing the plurality of out-of-stock events comprises:

analyzing a plurality of attribute sets comprised of respective combinations of the attributes associated with at least some of the out-of-stock events;

determining, for each attribute set, a probability for at least one of the duration of each out-of-stock event having the combination of attributes that form the respective attribute set, the frequency of the out-of-stock events having the combination of attributes that form the respective attribute set, and the loss associated with each out-of-stock event having the combination of attributes that form the respective attribute set; and

determining instances in which the probability is outside of a range of normal probabilities to thereby indicate at least one of an abnormally high service

level and an abnormally low service level, wherein the attribute sets for which the associated probabilities are outside of a range of normal probabilities are discovered attributes sets.

45. The method as recited in claim 41, wherein determining automatically the cause of the at least one out-of-stock event comprises matching attributes associated with the at least one out-of-stock event with at least one of a plurality of standard attribute sets.

46. The method as recited in claim 44, wherein matching attributes comprises correlating out-of-stock events for an item across retail outlets.

47. The method as recited in claim 46, wherein correlating out-of-stock events for an item across retail outlets comprises correlating out-of-stock events for an item with at least one of store planogram type, store type and size of shelf spacing.

48. The method as recited in claim 45, wherein matching attributes comprises correlating out-of-stock events occurring within a period of time across retail outlets.

49. The method as recited in claim 45, wherein matching attributes comprises identifying out-of-stock events for items that are being sales promoted.

50. The method as recited in claim 45, wherein matching attributes comprises identifying out-of-stock events for items that are being price-reduced.

51. The method as recited in claim 45, wherein matching attributes comprises correlating the time of the onset of an out-of-stock event with the commencement of a sales promotion.

52. The method as recited in claim 45, wherein matching attributes comprises correlating the time of the onset of an out-of-stock event with the commencement of a price-reduction.

53. The method as recited in claim 45, wherein matching attributes comprises identifying the quantity of out-of-stock events for a retail outlet.

54. The method as recited in claim 45, wherein matching attributes comprises correlating out-of-stock events to a time attribute chosen from the group consisting of day of the week, time of the day and time of the year.

55. A system for determining the cause of an out-of-stock event, comprising:

a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment; and

a computer monitoring system, comprising:

a memory circuit for storage of data,

a communication port in communication with at least one of said sensing circuits and said memory circuit; and

a processing circuit that is configured to control the flow of data between said memory circuit and said communication port,

wherein said processing circuit is configured to receive data pertaining to transactions involving items of inventory in said predetermined environment, detect a plurality of out-of-stock events for at least one item of inventory wherein each out-of-stock event has associated attributes, and determine automatically the cause of at least one out-of-stock event based upon the attributes associated therewith.

56. The system as recited in claim 55, wherein said processing circuit, in determining automatically the cause of the at least one out-of-stock event, analyzes the plurality of out-of-stock events according to an automated induction software algorithm to identify discovered attribute sets, and matches attributes associated with the at least one out-of-stock event with a discovered attribute set.

57. The system as recited in claim 56, wherein said processing circuit, in analyzing the plurality of out-of-stock events, analyzes a plurality of attribute sets comprised of respective combinations of the attributes associated with at least some of the out-of-stock events, determines, for each attribute set, a probability for at least one of the duration of each out-of-stock event having the combination of attributes that form the respective attribute set, the frequency of the out-of-stock events having the combination of attributes that form the respective attribute set, and the loss associated with each out-of-stock event having the combination of attributes that form the respective attribute set, and determines instances in which the probability is outside of a range of normal probabilities to thereby indicate at least one of an abnormally high service level and an abnormally low service level, wherein the attribute sets for which the associated probabilities are outside of a range of normal probabilities are discovered attributes sets.

58. The system as recited in claim 56, wherein said processor, in determining automatically the cause of the at least one out-of-stock event, matches attributes associated with the at least one out-of-stock event with at least one of a plurality of standard attribute sets.

59. A computerized method for determining customer impact occasioned by an out-of-stock event, said method comprising:

identifying each of a plurality of customers;

correlating current out-of-stock events to each customer's purchasing event;

analyzing historical purchasing data for each customer;

estimating, for each customer, an expected purchase amount for at least one out-of-stock item based upon the historical purchasing data; and

analyzing, for each customer, actual purchases during the customer's purchasing event relative to the estimated expected purchase amount for the at least one out-of-stock item.

60. The method as recited in claim 59, further comprising: determining that a substitute item has been purchased by said customer in lieu of purchasing an out-of-stock item.

61. The method as recited in claim 60, wherein said determining that a substitute item has been purchased comprises: assessing the amount of said substitute item purchased in excess of an estimated expected purchase amount of the substitute item.

62. The method as recited in claim 60, wherein said substitute item comprises: a substitute item having the same brand as the out-of-stock item.

63. The method as recited in claim 60, wherein said substitute item comprises: a substitute item having a different brand than the out-of-stock item.

64. The method as recited in claim 59, further comprising: determining that a purchase of an out-of-stock item has been delayed.

65. The method as recited in claim 64, wherein said determining that a purchase of an out-of-stock item has been delayed comprises: subtracting the expected purchase amount on a subsequent purchasing event of an item currently out-of-stock from the actual purchase amount of the item on a subsequent purchase event and determining that the difference exceeds zero.

66. The method as recited in claim 59, further comprising: determining that an out-of-stock item has resulted in a lost sale to the retailer.

67. The method as recited in claim 66, wherein said determining that an out-of-stock item has resulted in a lost sale further comprises: subtracting the expected purchase amount on a subsequent purchasing event of an item currently out-of-stock from the actual purchase amount of the item on a subsequent purchase event and determining that the difference is less than zero.

68. The method as recited in claim 59, further comprising: estimating customer reaction to an out-of-stock event for a predetermined item.

69. The method as recited in claim 68, wherein said customer reaction to stock outs is used as the basis for measuring loyalty to specific items, brands, stores, and store chains.

70. The method as recited in claim 69, wherein said customer reaction to stock outs comprises one of the following: switching to another item of the same brand; switching to an item of another brand; delaying purchase of the original item; or loss of sale.

71. The method as recited in claim 68, wherein said customer reaction further comprises: an impact event chosen from the group consisting of: switching to another brand, switching to the same brand, delaying the purchase, or losing the sale.

72. The method as recited in claim 71, wherein estimating customer reaction to an out-of-stock event comprises: determining item loyalty (IL), as follows:

$$IL = SL + jSB + kSD$$

wherein SL is a percentage of sales of the item that was out-of-stock that were lost during the out-of-stock event, SB is a percentage of sales of the item that was out-of-stock that switched to sales of another item of the same brand during the out-of-stock event, SD is a percentage of sales of the item that was out-of-stock that were delayed during the out-of-stock event, and j and k are constants.

73. The method as recited in claim 72, further comprising: determining brand loyalty based upon an average across all items of a brand of the respective item loyalties.

74. The method as recited in claim 72, further comprising: determining store loyalty by averaging (1-SL) for all items.

75. A system for determining the impact of an out-of-stock event, comprising:

a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment; and

a computer monitoring system, comprising:

a memory circuit for storage of data,

a communication port in communication with at least one of said sensing circuits and said memory circuit; and

a processing circuit that is configured to control the flow of data between said memory circuit and said communication port,

wherein said processing circuit is configured to identify each of a plurality of customers, to correlate current out-of-stock events to each customer's purchasing event, to analyze historical purchasing data for each customer, to estimate, for each customer, an expected purchase amount for at least one out-of-stock item based upon the historical purchasing data, and to analyze, for each customer, actual purchases during the customer's purchasing event relative to the estimated expected purchase amount for the at least one out-of-stock item.

76. The system as recited in claim 75, wherein said processing circuit also determines that a substitute item has been purchased by said customer in lieu of purchasing an out-of-stock item.

77. The system as recited in claim 75, wherein said processing circuit also determines that a purchase of an out-of-stock item has been delayed.

78. The system as recited in claim 75, wherein said processing circuit also determines that an out-of-stock item has resulted in a lost sale to the retailer.

79. The system as recited in claim 75, wherein said processing circuit also estimates customer reaction to an out-of-stock event for a predetermined item.

80. The system as recited in claim 79, wherein said processing circuit estimates customer reaction to an out-of-stock event by determining item loyalty (IL) as follows:

$$IL = SL + jSB + kSD$$

wherein SL is a percentage of sales of the item that was out-of-stock that were lost during the out-of-stock event, SB is a percentage of sales of the item that was out-of-stock that switched to sales of another item of the same brand during the out-of-stock event, SD is a percentage of sales of the item that was out-of-stock that were delayed during the out-of-stock event, and j and k are constants.

81. The system according to claim 80, wherein said processing circuit also determines brand loyalty based upon an average across all items of a brand of the respective item loyalties.

82. The system according to claim 81, wherein said processing circuit also determines store loyalty by averaging (1-SL) for all items.

83. An item velocity monitoring system, comprising:

(a) a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment;

(b) a computer monitoring system, comprising:

(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a bulk memory storage device;

(ii) a communications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and

(iii) a processing circuit that is configured to control the flow of data between said memory circuit and said communications port;

(c) said processing circuit also being configured to:

(i) receive data pertaining to at least one transaction involving at least one item of inventory in said predetermined environment; and

(ii) dynamically determine probability pattern of a velocity of said at least one item, after said at least one transaction to determine whether an observed velocity is one of: (i) occurring too slowly, or (ii) occurring too quickly.

84. The item velocity monitoring system as recited in claim 83, wherein said dynamically determined probability pattern is stored in said memory circuit and uses a statistical model to predict a probability of inter-arrival times of said at least one item.

85. The item velocity monitoring system as recited in claim 84, wherein said processing circuit is further configured to detect an Out-of-Stock Event using a probability of observing zero sales of said at least one item since a last observed sale of that item.

86. The item velocity monitoring system as recited in claim 85, wherein said Out-of-Stock Event comprises a time interval during which said at least one item appears to be physically out-of-stock, and upon the occurrence of said Out-of-Stock Event the computer monitoring system summarizes events, determines their causes, and measures their impacts.

87. The item velocity monitoring system as recited in claim 84, wherein said dynamically determined probability pattern is determined by training said computer monitoring system by use of one of: (i) historical transaction data, or (ii) transaction data that is gathered in substantially real time.

88. The item velocity monitoring system as recited in claim 87, wherein said training of the computer monitoring system occurs in a plurality of iterative passes

to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

89. The item velocity monitoring system as recited in claim 88, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution for an inter-arrival interval between sales of said at least one item, and wherein said inter-arrival interval is stated either in units of: (i) time, or (ii) quantity of sales in monetary units.

90. The item velocity monitoring system as recited in claim 83, wherein the velocity of said at least one item comprises two random variables, inter-arrival time and quantity, which are linked together as a renewal-reward process, in which the quantity of an item is a separate random log-normal variable with a mean beta and a beta variance, and wherein said inter-arrival time comprises a modified Poisson distribution.

91. An item velocity monitoring system, comprising:

(a) a plurality of sensing circuits that detect at least one item as it is moved to predetermined locations within a predetermined environment;

(b) a computer monitoring system, comprising:

(i) a memory circuit for storage of data, said memory circuit containing a quantity of random access memory (RAM) and a bulk memory storage device;

(ii) a communications port that is effectively connected to at least one of said sensing circuits and to said memory circuit; and

(iii) a processing circuit that is configured to control the flow of data between said memory circuit and said communications port; and is further configured to automatically train said computer monitoring system using either historical data or data gathered in substantially real time, thereby learning item velocities for a plurality of items.

92. The item velocity monitoring system as recited in claim 91, wherein said item velocities vary as a function of: total predetermined environment velocity, time of day, day of week, season, holidays, and market conditions of said predetermined environment.

93. The item velocity monitoring system as recited in claim 91, wherein said predetermined environment comprises one of: a retail store, a chain of retails stores, a warehouse, a chain of warehouses, a distribution point, or a chain of distribution points.

94. The item velocity monitoring system as recited in claim 91, wherein said processing circuit is further configured to automatically re-train said computer monitoring system on a periodic basis using substantially real time data throughout a periodic interval.

95. The item velocity monitoring system as recited in claim 91, wherein said training of the computer monitoring system occurs in a plurality of iterative passes to create: a Final Base Lambda Table, a Final Adjustment Alpha Table, a Store Table, and a UPC Table.

96. The item velocity monitoring system as recited in claim 95, wherein said iterative passes comprise: (i) computing Initial Base Lambdas using total store sales and total category sales; (ii) computing Intermediate Base Lambdas using item transaction data and said item's inter-arrival time using said Initial Base Lambdas; (iii) computing Initial Adjustment Alphas using an adjusted item inter-arrival time and a plurality of current effects; (iv) computing Final Base Lambdas using said Initial Adjustment Alphas and using said item transaction data and said item's inter-arrival time; and (v) computing Final Adjustment Alphas using said Final Base Lambdas and a plurality of current effects, and computing a Beta Table.

97. The item velocity monitoring system as recited in claim 96, wherein said Final Base Lambda Table, Final Adjustment Alpha Table, Store Table, and UPC Table are used to calculate a probability distribution for an inter-arrival interval between sales of said at least one item, and wherein said inter-arrival interval is stated either in units of: (i) time, or (ii) quantity of sales in monetary units.